

**REMARKS**

Claims 49-68 are currently pending in the application.  
Claims 49-52, 55, 58, 60, 61, and 68 have been amended

**CLAIM OBJECTION BY EXAMINER**

Examiner objected to Claims 60 and 61 and in support of his objection stated that --the-- or --said-- should be inserted before "first and second wings" to make clear the first and second wings are those recited in base Claim 58. Applicant has amended Claims 60 and 61 as requested by Examiner.

**CLAIMS REJECTION UNDER 37 C.F.R. § 112**

In the Office Action mailed March 6, 2003, the Examiner rejected Claims 49-57 and 68 under 37 C.F.R. § 112, and in support of his rejection stated:

"5. Claims 49-57 and 68 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is insufficient support in the originally specification for the new limitation "a uniform thickness between the upper and lower surfaces", recited in claims 49, 52, 55 and 68. Despite careful review of the specification, the examiner cannot find any discussion of uniformity of thickness."

Applicant has amended the claims to remove the limitation of a "uniform thickness". Therefore, the Applicant requests removal of this objection.

Claim 52 was rejected by the Examiner under 35 U.S.C. § 112, second paragraph, and in support of Examiner's rejection stated:

"7. Claim 52 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how many wings and nozzles are required by Claim 52. It is unclear if the phrasing "further comprising: a plurality of wings" requires at total of at least two wings, or at least two wings in addition to the wing required by the parent claim 49, for a total of at least three wings. Likewise, it is unclear if at least two or at least three nozzles are required."

Applicant has amended Claim 52 and requests removal of this rejection.

**CLAIMS REJECTION UNDER 35 U.S.C. § 102**

In the Office Action mailed March 6, 2003, the Examiner rejected Claims 49-52, 54-56, 58, 59, 61 and 68 under 35 U.S.C. § 102(b), and in support of Examiner's rejection stated:

"9. Claims 49-52, 54-56, 58, 59, 61 and 68 are rejected under 35 U.S.C. 102(b) as being anticipated by Smith (US 4,929,088). Regarding claim 49, Smith ('088) discloses a system comprising a duct (22), a wing (14) having a first end and second end, an upper surface, a lower surface and a uniform thickness between the upper and lower surfaces extending from the first to the second ends of the wing, the wing non-movably coupled within the passageway of the duct and configured to shed a vortex at an edge of the second end of the wing, a nozzle (40) to discharge a mixture into passageway, the nozzle located adjacent the edge of the second end of the wing such that

the nozzle discharges the mixture into the vortex at a point wherein the vortex is shed by the edge of the second end of the wing. Claims 50 and 51 fail to further structurally limit the claimed apparatus, because the limitations of the claims solely relate to intended use of the claimed apparatus. As held in *In re Casey* 152 USPQ 235 (CCPA 1967), 'the manner or method in which such machine is to be utilized is not germane to the issue of patentability of the machine itself'. Regarding claim 52, the system comprises a plurality of wings (14, 18) having a first end and second end, and upper surface, a lower surface and a uniform thickness between the upper and lower surfaces extending from the first to the second end thereof, the wings non-movably coupled within the passageway of the duct and configured to shed a vortex at an edge of the second end thereof; and a plurality of nozzles (40,42) to discharge a mixture into passageway, the nozzle located adjacent the edge of the second end of one of the wings such that the nozzles discharge the mixture into the vortex at a point wherein the vortex is shed by the edge of the second end of the wings. Regarding claim 54, the wing is non-moveably coupled to the inner surface of the duct at a lift generating angle of attack such that the first end of the wing is positioned substantially upstream a direction of travel of the gas stream through the passageway and such that the second end of the wing is substantially down stream of the direction of travel of the gas stream through the passageway (see Fig. 6). Regarding claim 55, the system further comprises a second wing (18) having a first end and second end, and upper surface, a lower surface and a uniform thickness between the upper and lower surfaces extending from the first to the second ends of the wing, the second wing non-movably coupled within the passageway of the duct and configured to shed a vortex at edge of the second end of the second wing, and wherein the second wing is non-moveably coupled to the inner surface of the duct at a lift generating angle of attack such that the first end of the second wing is positioned substantially upstream a direction of travel of the gas stream through the passageway and such that the second end of the second wing is substantially down stream of the direction of travel of

the gas stream through the passageway (see Fig. 6); and a second nozzle (42) to discharge a mixture into passageway, the second nozzle located adjacent the edge of the second end of the second wing such that the nozzle discharges the mixture into the vortex at a point wherein the vortex is shed by the edge of the second end of the second wing. Regarding claim 56, the wing and the second wing are coupled to the inner surface of the duct such that the first ends of the wing and second wing are located substantially along a plane perpendicular to the direction of travel of the gas stream through the passageway of the duct (see Fig. 6). Regarding claim 58, Smith ('088) discloses a system comprising a duct (22) with an inner surface defining a passage; a first wing (14) having a first end and a second end, the first wing non-movably coupled with in the passageway of the duct such that the first end of the first wing is positioned along a plane within the passageway of the duct, the plane substantially perpendicular to a direction of travel of a gas stream through the passageway; a second wing (18) having a first end and a second end, the second wing non-movably coupled with in the passageway of the duct such that the first end of the first wing is positioned along the plane within the passageway of the duct, the plane substantially perpendicular to a direction of travel of a gas stream through the passageway; a first nozzle (40) to discharge a mixture into the passageway, the first nozzle located adjacent the edge of the second end of the first wing; and a second nozzle (42) to discharge a mixture into the passageway, the second nozzle located adjacent the edge of the second end of the wing. Regarding claim 59, the first and second wings are non-movably coupled to first and second opposing walls respectively within the duct along the same plane in the passageway (see Figs. 6 and 7). Regarding claim 61, first and second wings are non-movably coupled the inner surface of the duct at a lift generating angle of attack such that the first ends of the first and second wings are positioned substantially upstream of the direction of travel of the gas stream through the passageway and such that the second ends of the first and second wings are substantially down stream of the gas

stream through the passageway (see Fig. 6). Regarding claim 68, Smith ('088) discloses a system comprising a duct (22) with an inner surface defining a passage; a first wing (14) having a first end and a second end, the first wing non-movably coupled with in the passageway of the duct such that the first end of the first wing is positioned along a plane within the passageway of the duct, the plane substantially perpendicular to a direction of travel of a gas stream through the passageway, and wherein the first wing having a uniform thickness between the upper and lower surfaces extending from the first end to the second end of the first wing; a second wing (18) having a first end and a second end, the second wing non-movably coupled with in the passageway of the duct such that the first end of the first wing is positioned along the plane within the passageway of the duct, the plane substantially perpendicular to a direction of travel of a gas stream through the passageway, and wherein the second wing having a uniform thickness between the upper and lower surfaces extending from the first end to the second end of the first wing; a first nozzle (40) to discharge a mixture into the passageway, the first nozzle located adjacent the edge of the second end of the first wing; and a second nozzle (42) to discharge a mixture into the passageway, the second nozzle located adjacent the edge of the second end of the wing."

The Examiner further rejected Claims 49-52, and 54-68 and in support of Examiner's rejection stated:

"10. Claims 49-52, 54-68 are rejected under 35 U.S.C. 102(b) as being anticipated by Streiff et al (US 5,456,533). Regarding claim 49, Streiff ('533) discloses a system comprising a duct (7), a wing (30) having a first end and second end, an upper surface, a lower surface and a uniform thickness between the upper and lower surfaces extending from the first to the second ends of the wing, the wing non-movably coupled within the passageway of the duct and configured to shed a vortex at an edge of the second end of the wing, a nozzle (21) to discharge a mixture into passageway, the nozzle located adjacent the edge of the second end of the wing such that the nozzle



discharges the mixture into the vortex at a point wherein the vortex is shed by the edge of the second end of the wing (see especially Figs. 9a and 9b). Claims 50 and 51 fail to further structurally limit the claimed apparatus, because the limitations of the claims solely relate to intended use of the claimed apparatus. As held in *In re Casey* 152 USPQ 235 (CCPA 1967), 'the manner or method in which such machine is to be utilized is not germane to the issue of patentability of the machine itself'. Regarding claim 52, the system comprises a plurality of wings (30) having a first end and second end, and upper surface, a lower surface and a uniform thickness between the upper and lower surfaces extending from the first to the second end thereof, the wings non-movably coupled within the passageway of the duct and configured to shed a vortex at an edge of the second end thereof; and a plurality of nozzles (21) to discharge a mixture into passageway, the nozzle located adjacent the edge of the second end of one of the wings such that the nozzles discharge the mixture into the vortex at a point wherein the vortex is shed by the edge of the second end of the wings (see col. 2, lines 14-23). Regarding claim 54, the wing is non-moveably coupled to the inner surface of the duct at a lift generating angle of attack such that the first end of the wing is positioned substantially upstream a direction of travel of the gas stream through the passageway and such that the second end of the wing is substantially downstream of the direction of travel of the gas stream through the passageway (see Figs. 9a and 9b). Regarding claim 55, the system further comprises a second wing (30) having a first end and second end, and upper surface, a lower surface and a uniform thickness between the upper and lower surfaces extending from the first to the second ends of the wing, the second wing non-movably coupled within the passageway of the duct and configured to shed a vortex at edge of the second end of the second wing, and wherein the second wing is non-moveably coupled to the inner surface of the duct at a lift generating angle of attack such that the first end of the second wing is positioned substantially upstream a direction of travel of the gas stream through the passageway and such that the second end of the second

wing is substantially down stream of the direction of travel of the gas stream through the passageway (see Fig. 9a and 9b); and a second nozzle (21) to discharge a mixture into passageway, the second nozzle located adjacent the edge of the second end of the second wing such that the nozzle discharges the mixture into the vortex at a point wherein the vortex is shed by the edge of the second end of the second wing (see col. 2, lines 14-23). Regarding claim 56, the wing and the second wing are coupled to the inner surface of the duct such that the first ends of the wing and second wing are located substantially along a plane perpendicular to the direction of travel of the gas stream through the passageway of the duct (see Fig. 10, col. 2, lines 14-23). Regarding claim 57, the upper and lower surfaces of the wing defines an upper and lower arcuate shapes of the wing extending from the first end to the second end of the wing wherein the upper arcuate shape is substantially similar to the lower arcuate shape of the wing (see col. 2, lines 14-18; col. 3, lines 25-26, Fig. 3d). Regarding claim 58, Streiff ('533) discloses a system comprising a duct (7) with an inner surface defining a passage; a first wing (30) having a first end and a second end, the first wing non-movably coupled with in the passageway of the duct such that the first end of the first wing is positioned along a plane within the passageway of the duct, the plane substantially perpendicular to a direction of travel of a gas stream through the passageway; a second wing (30) having a first end and a second end, the second wing non-movably coupled with in the passageway of the duct such that the first end of the first wing is positioned along the plane within the passageway of the duct, the plane substantially perpendicular to a direction of travel of a gas stream through the passageway; a first nozzle (21) to discharge a mixture into the passageway, the first nozzle located adjacent the edge of the second end of the first wing; and a second nozzle (21) to discharge a mixture into the passageway, the second nozzle located adjacent the edge of the second end of the wing (see Figs. 9a, 9b, 10; col. 2, lines 14-23). Regarding claim 59, the first and second wings are non-movably coupled to first and second opposing walls respectively within the duct along

the same plane in the passageway (see lines 14-23). Regarding claim 60, the wings are cambered wings (see col. 2, lines 14-18; col. 3, lines 25-26, Fig. 3d). Regarding claim 61, first and second wings are non-movably coupled the inner surface of the duct at a lift generating angle of attack such that the first ends of the first and second wings are positioned substantially upstream of the direction of travel of the gas stream through the passageway and such that the second ends of the first and second wings are substantially down stream of the gas stream through the passageway (see Fig. 6). Regarding claims 62-64, third and fourth wings and nozzles according to claims 62-64 are disclosed (see Figs. 9a, 9b, 10; col. 2, lines 14-23). Regarding claim 65, the wings are cambered wings (see col. 2, lines 14-18; col. 3, lines 25-26, Fig. 3d). Claims 66 and 67 fail to further structurally limit the claimed apparatus, because the limitations of the claims solely relate to intended use of the claimed apparatus. As held in *In re Casey supra.*, 'the manner or method in which such machine is to be utilized is not germane to the issue of patentability of the machine itself'. Regarding claim 68, Streiff ('533) discloses a system comprising a duct (7) with an inner surface defining a passage; a first wing (30) having a first end and a second end, the first wing non-movably coupled with in the passageway of the duct such that the first end of the first wing is positioned along a plane within the passageway of the duct, the plane substantially perpendicular to a direction of travel of a gas stream through the passageway, and wherein the first wing having a uniform thickness between the upper and lower surfaces extending from the first end to the second end of the first wing; a second wing (30) having a first end and a second end, the second wing non-movably coupled with in the passageway of the duct such that the first end of the first wing is positioned along the plane within the passageway of the duct, the plane substantially perpendicular to a direction of travel of a gas stream through the passageway, and wherein the second wing having a uniform thickness between the upper and lower surfaces extending from the first end to the second end of the first wing; a first nozzle (21) to



discharge a mixture into the passageway, the first nozzle located adjacent the edge of the second end of the first wing; and a second nozzle (21) to discharge a mixture into the passageway, the second nozzle located adjacent the edge of the second end of the wing (see Figs. 9a, 9b, 10; col. 2, lines 14-23)."

The Examiner further rejected Claim 58 and in support of Examiner's rejection stated:

"11. Claims 58 are rejected under 35 U.S.C. 102(b) as being anticipated by "Selective Catalytic Reduction" (SCR), filed in the IDS which is paper No. 4. Regarding claim 58 as seen on pages 1-3, SCR discloses a system comprising a duct; first and second wings having first and second ends, the wings non-movably coupled within the passageway of the duct with the first ends positioned along a plane within the duct substantially perpendicular to the direction of travel of the gas stream through the passageway; and first and second nozzles to discharge a mixture into the passageway of the duct, the nozzles respectively located adjacent the edges of the second ends of the wings."

**Independent claim 49**

The Applicant has amended claim 49. With this amendment, the Applicant respectfully submits that the applied references fail to teach explicitly or inherently at least one limitation, namely the wing...configured to shed a vortex at an edge of a second end of the wing, the first end and second end extend into the passageway, the first end positioned upstream of a direction of travel of the gas stream, and the second end positioned downstream of the direction of travel of the gas stream. Therefore, independent claim 49 should be allowable. And, as claims 50-57 depend therefrom, they, too, should be allowable.

**Independent claim 58**

The Applicant has amended Claim 58. With this amendment, the Applicant respectfully submits that the applied references fail to teach explicitly or inherently at least one limitation, namely the first end of the first wing extends into the passageway and is positioned along a plane within the passageway of the duct, the plane substantially perpendicular to a direction of travel of the gas stream through the passageway; and first end of the second wing extends into the passageway and is positioned along the plane within the passageway of the duct substantially perpendicular to the direction of travel of the gas stream through the passageway. Therefore, claim 58 should be allowable. And, as claims 59-67 depend from 58, they, too, should be allowable.

**Independent Claim 68**

The Applicant amended Claim 68. With this amendment, the Applicant respectfully submits that at least one element is absent in the applied references, namely the first end of the first wing extends into the passageway and is located along a plane within the passageway of the combustion exhaust duct, the plane substantially perpendicular to a direction of travel of the combustion gas exhaust through the passageway and the first end of the second wing extends into the passageway and is located along the plane within the passageway of the combustion exhaust duct substantially perpendicular to the direction of travel of the combustion gas exhaust through the passageway. Therefore, claim 68 should be allowable.

**CLAIM REJECTIONS UNDER 35 U.S.C. § 103**

In the Office Action mailed March 6, 2003, the Examiner rejected Claims 62-64, 66, 67 and 53 and in support of Examiner's rejection stated:

"13. Claims 62-64, 66 and 67 rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (US 4,929,088), as applied to Claim 58 above. With Smith ('088) further discloses third and fourth wings (16,20) according to claims 62-64, it is not explicitly stated that these wing have corresponding third and fourth nozzles. However, it considered that it would have been obvious to one of ordinary skill in the art have provided additional nozzles to inject additional fluids, or to provide fluid at additional points. See *In re Harza*, 124 USPQ 378 (CCPA 1960) and *St. Regis Paper Co. v. Bemis Co., Inc.* 193 USPQ 8,11 (7<sup>th</sup> Cir. 1977) regarding the obviousness of duplicating parts. The wings are mounted in on opposite walls in accordance with claim 64 (see Fig. 6). Claims 66 and 67 fail to further structurally limit the claimed apparatus, because the limitations of the claims solely relate to intended use of the claimed apparatus. As held in *In re Casey supra.*, 'the manner or method in which such machine is to be utilized is not germane to the issue of patentability of the machine itself'.

14. Claims 62 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Selective Catalytic Reduction" (SCR), as applied to claim 58 above. Third and forth wing pairs according to claims 62 and 63 are not explicitly disclosed. However, it considered that it would have been obvious to one of ordinary skill in the art have provided additional wings and nozzles to provide fluid at additional points. See *In re Harza*, 124 USPQ 378 (CCPA 1960) and *St. Regis Paper Co. v. Bemis Co., Inc.* 193 USPQ 8, 11 (7<sup>th</sup> Cir. 1977) regarding the obviousness of duplicating parts.

15. Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Streiff ('533), as applied to claim

49 above, in view of Althaus et al. (US 5,518,311). Streiff ('533) does not disclose a second nozzle at the second end of the wing. Althaus ('311) teaches placement of two nozzle at two edges of a wing (see Figs. 8 and 14). It is considered that it would have been obvious to one of ordinary skill in the art to have provided the wing of Streiff ('533) with a second nozzle on a second end as taught by Althaus ('311), because Althaus ('311) explains that such an arrangement improves mixing by extending vortices (see col. 6, lines 15-23). See also, *In re Harza*, supra. and *St. Regis Paper Co. v. Bemis Co., Inc.* supra. regarding the obviousness of duplicating parts.

**Independent Claim 49, 58, and 68**

For the reasons stated above, independent Claims 49, 58, and 68 are allowable. The cited references alone or in combination failed to teach, suggest, or describe the invention as claimed in Claims 49, 58, and 68. Therefore, the claims depending therefrom, claims 50-58 and 59-67, should also be allowable.

**CONCLUSION**

Applicant respectfully submits that this Application is in condition for allowance, and Applicant earnestly seeks such allowance of all claims currently pending in the application for the reasons stated herein and further request that the Examiner allow Claims 49-68. Should the Examiner have any questions, comments, or suggestions in furtherance of the prosecution of this Application, please contact Applicant's attorney at 214.979.3093. Applicant, through its attorney, stands ready to conduct a telephone interview with the Examiner to review this Application if the Examiner believes that such an interview would assist in the advancement of this Application.

To the extent that any further fees are required during the pendency of this Application, including petition fees, the Commissioner is hereby authorized to charge payment of any additional fees, including, without limitation, any fees under 37 C.F.R. § 1.16 or 37 C.F.R. § 1.17, to Deposit Account No. 23-3189 of Hunton & Williams (Dallas) and reference Attorney Docket No. 82274.472023. In the event that any additional time is needed for this filing, or any additional time in excess of that requested in a petition for an extension of time, please consider this a petition for an extension of time for any needed extension of time pursuant to 37 C.F.R. § 1.136 or any other section or provision of Title 37. Applicant respectfully requests that the Commissioner grant any such petition and authorize the Commissioner to charge the Deposit Account referenced above. Please credit any overpayments to this same Deposit Account.



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AMENDMENT AND RESPONSE  
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This is intended to be a complete response to the Office  
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Respectfully submitted, TC 1700

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